

## CLAIM AMENDMENTS

### Claim Amendment Summary

#### **Claims pending**

- At time of the Action: Claims 1, 4-9, 12-24, 26-28 and 35-41.
- After this Response: Claims 1, 4-9, 12-24, 26-28 and 35-41.

**Canceled or Withdrawn claims:** none

**Amended claims:** 1, 7, 9, 14, 18-22, 24 and 35.

**New claims:** none.

### Claims:

1. **(CURRENTLY AMENDED)** A method for concealing data within a digital signal, the method comprising:

receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message;

imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposing is carried out by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern;

processing the digital signal into a series of bitframes, wherein each bitframe includes a set of frames, and wherein each frame includes a set of blocks; and

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1 encoding a ~~third~~ the third data pattern into the digital signal, wherein such  
2 ~~third data pattern is the result of the imposing~~ wherein a different bit of the  
3 watermark is encoded in each frame of at least one subject bitframe, and wherein a  
4 same bit of the covert message is encoded in each frame of the subject bitframe.

5  
6 2. (CANCELED)

7  
8 3. (CANCELED)

9  
10 4. (PREVIOUSLY PRESENTED) A method as recited in claim 1,  
11 wherein the Boolean operation is XOR.

12  
13 5. (PREVIOUSLY PRESENTED) A method as recited in claim 1,  
14 wherein

15 a pattern of discrete values may be encoded into the digital signal in one of  
16 multiple discrete states;

17 the imposing comprises encoding multiple values of the first data pattern  
18 into the digital signal into a state that indicates a single discrete value of the  
19 second data pattern.

20  
21 6. (PREVIOUSLY PRESENTED) A method as recited in claim 1,  
22 wherein the digital signal is selected from a group consisting of a digital audio  
23 signal, a digital video signal, a digital image signal, and a digital multimedia  
24 signal.

1       7. **(CURRENTLY AMENDED)** A method as recited in claim 1, wherein  
2 ~~the first data pattern is a watermark the different bit of the watermark which is~~  
3 ~~encoded in a respective frame of the subject bitframe, is repeated in each block of~~  
4 ~~the respective frame.~~

5  
6       8. **(PREVIOUSLY PRESENTED)** A computer having a computer-  
7 readable medium as recited in claim 18.  
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RESPONSE TO OFFICE ACTION DATED

1       9. **(CURRENTLY AMENDED)** A method for revealing a covert data  
 2 pattern of discrete values from an encoded data pattern of discrete values in a  
 3 digital signal, the method comprising:

4       receiving a digital signal, the digital signal being segmented into a series of  
 5 bitframes which each include a set of frames, the signal having a watermark  
 6 encoded therein, the watermark being an encoded data pattern of discrete values is  
 7 encoded into the signal in one of multiple discrete states, the encoded data pattern  
 8 representing multiple data patterns comprising an original watermark data pattern  
 9 and a covert data pattern; the digital signal having an encoded data pattern of  
 10 discrete values representing a first data pattern of discrete values which are bits of  
 11 a watermark, a different bit of the watermark encoded in each frame of at least one  
 12 subject bitframe, and a covert data pattern of discrete values which are bits of a  
 13 covert message, a same bit of the covert message encoded in each frame of the  
 14 subject bitframe; and

15       extracting a discrete value of the covert data pattern from a plurality of  
 16 values of the encoded data pattern, wherein the extracting is carried out by  
 17 decoding a single discrete value of the covert data pattern from the digital signal  
 18 based upon a state of a multiple discrete values of the encoded data pattern.

19       20. **(CANCELED)**

21       22. **(CANCELED)**

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1           **12. (PREVIOUSLY PRESENTED)** A method as recited in claim 9,  
 2 wherein the digital signal is selected from a group consisting of a digital audio  
 3 signal, a digital video signal, a digital image signal, and a digital multimedia  
 4 signal.

5  
 6           **13. (PREVIOUSLY PRESENTED)** A computer having a computer-  
 7 readable medium as recited in claim 19.

8  
 9           **14. (CURRENTLY AMENDED)** A method for encoding a watermark with  
 10 a covert message into a digital audio signal, ~~wherein binary bits of the watermark~~  
 11 ~~may be encoded into the signal in multiple states~~, the method comprising:

12           encoding multiple binary bits of the watermark into frames of at least one  
 13 subject bitframe of the digital signal, a different one of the multiple binary bits  
 14 encoded into each of the frames, the multiple binary bits encoded into the digital  
 15 signal in multiple states; and

16           encoding a binary bit of the covert message over all the frames of the  
 17 subject bitframe of the digital signal, the binary bit of the covert message  
 18 indicating into a state that indicates a single discrete value of the covert message.

19  
 20           **15. (ORIGINAL)** A method as recited in claim 14, wherein the multiple  
 21 states are positive or negative modifications to magnitudes of one or more  
 22 subbands in the frequency spectrum of a sample of the signal.

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1           **16. (PREVIOUSLY PRESENTED)**       A method for imposing a covert  
2 message into a watermark, the method comprising:  
3           generating multiple watermarks;  
4           assigning each of the multiple watermarks to each of the possible discrete  
5 values for at least a portion of the covert message;  
6           selecting a watermark that corresponds to an actual discrete value of at least  
7 a specific portion of the covert message;  
8           without encoding any portion of the covert message itself into a digital  
9 signal, encoding the selected watermark into the digital signal.

10  
11           **17. (PREVIOUSLY PRESENTED)**       A method as recited in claim 16,  
12 wherein  
13           size of all portions of the covert message is N bits long;  
14           number of the multiple watermarks is  $2^N$ .

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1           18. (CURRENTLY AMENDED) A computer-readable medium having  
 2 computer-executable instructions that, when executed by a computer, perform a  
 3 method for concealing data within a digital signal, the method comprising:

4           receiving a first data pattern of discrete values which are bits of a  
 5 watermark and a second data pattern of discrete values which are bits of a covert  
 6 message;

7           imposing a discrete value of the second data pattern over one or more  
 8 discrete values of the first data pattern to generate a third data pattern, wherein the  
 9 imposing is carried out by performing a Boolean operation with a discrete value of  
 10 the second data pattern and multiple discrete values of the first data pattern;

11           processing the digital signal into a series of bitframes, wherein each  
 12 bitframe includes a set of frames, and wherein each frame includes a set of blocks;  
 13 and

14           encoding the third data pattern into the digital signal, wherein such third  
 15 data pattern is the result of the imposing wherein a different bit of the watermark  
 16 is encoded in each frame of at least one subject bitframe, and wherein a same bit  
 17 of the covert message is encoded in each frame of the subject bitframe.

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1           19. (CURRENTLY AMENDED) A computer-readable medium having  
 2 computer-executable instructions that, when executed by a computer, perform a  
 3 method for revealing a covert data pattern of discrete values from an encoded data  
 4 pattern of discrete values in a digital signal, the method comprising:

5           receiving a digital signal, the digital signal being segmented into a series of  
 6 bitframes which each include a set of frames, the signal having a watermark  
 7 encoded therein, the watermark being an encoded data pattern of discrete values is  
 8 encoded into the signal in one of multiple discrete states, the encoded data pattern  
 9 representing multiple data patterns comprising an original watermark data pattern  
 10 and a covert data pattern; the digital signal having an encoded data pattern of  
 11 discrete values representing a first data pattern of discrete values which are bits of  
 12 a watermark, a different bit of the watermark encoded in each frame of at least one  
 13 subject bitframe, and a covert data pattern of discrete values which are bits of a  
 14 covert message, a same bit of the covert message encoded in each frame of the  
 15 subject bitframe; and

16           extracting a discrete value of the covert data pattern from a plurality of  
 17 values of the encoded data pattern, wherein the extracting is carried out by  
 18 decoding a single discrete value of the covert data pattern from the digital signal  
 19 based upon a state of a multiple discrete values of the encoded data pattern.

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1        20. (CURRENTLY AMENDED) An apparatus comprising:

2              a processor;

3              a covert-channel-encoder executable on the processor to:

4                  receive a first data pattern of discrete values which are bits of a  
 5 watermark and a second data pattern of discrete values which are bits of a covert  
 6 message;

7                  impose a discrete value of the second data pattern over one or more  
 8 discrete values of the first data pattern to generate a third data pattern, wherein the  
 9 imposition is carried out by performing a Boolean operation with a discrete value  
 10 of the second data pattern and multiple discrete values of the first data pattern;

11                 process the digital signal into a series of bitframes, wherein each  
 12 bitframe includes a set of frames, and wherein each frame includes a set of blocks;  
 13 and

14                 encode the third data pattern into the digital signal, which third data  
 15 pattern is based upon the result of the imposing wherein a different bit of  
 16 the watermark is encoded in each frame of at least one subject bitframe, and  
 17 wherein a same bit of the covert message is encoded in each frame of the  
 18 subject bitframe.

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 atty: Kasey C. Christie

PAGE 13/34 \* RCVD AT 8/5/2005 1:55:56 PM (Eastern Daylight Time) \* SVR:USPTO-EFXRF-6/28 \* DNIS:2738300 \* CSID:509 323 8979 \* DURATION (mm:ss):09:10

1           **21. (CURRENTLY AMENDED)** An apparatus comprising;

2           a processor;

3           a covert-channel-decoder executable on the processor to:

4           receive a digital signal, the digital signal being segmented into a  
 5           series of bitframes which each include a set of frames, the signal having a  
 6           watermark encoded therein, the watermark being an encoded data pattern of  
 7           discrete values is encoded into the signal in one of multiple discrete states, the  
 8           encoded data pattern representing multiple data patterns comprising an original  
 9           watermark data pattern and a covert data pattern; the digital signal having an  
 10          encoded data pattern of discrete values representing a first data pattern of discrete  
 11          values which are bits of a watermark, a different bit of the watermark encoded in  
 12          each frame of at least one subject bitframe, and a covert data pattern of discrete  
 13          values which are bits of a covert message, a same bit of the covert message  
 14          encoded in each frame of the subject bitframe; and

15          extract a discrete value of the covert data pattern from a plurality of  
 16          values of the encoded data pattern, wherein the extracting is carried out by  
 17          decoding a single discrete value of the covert data pattern from the digital  
 18          signal based upon a state of a multiple discrete values of the encoded data  
 19          pattern.

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 City: Kasey C. Christo

PAGE 14/34 \* RCVD AT 8/5/2005 1:55:56 PM [Eastern Daylight Time] \* SVR:USPTO-EFXRF-6/28 \* DNIS:2738300 \* CSID:509 323 8979 \* DURATION (mm:ss):09-10

1           **22. (CURRENTLY AMENDED)** A data encoding system for concealing  
2 data within a digital signal, the system comprising:

3           a receiver for receiving a first data pattern of discrete values which are bits  
4 of a watermark and a second data pattern of discrete values which are bits of a  
5 covert message;

6           an imposer coupled to such receiver, the imposer for imposing a discrete  
7 value of the second data pattern over one or more discrete values of the first data  
8 pattern to generate a third data pattern, wherein the imposing is carried out by  
9 performing a Boolean operation with a discrete value of the second data pattern  
10 and multiple discrete values of the first data pattern;

11          an encoder coupled to the receiver and the imposer, the encoder for  
12 inserting within the digital signal one or more values of a third the third data  
13 pattern which are results of the imposer's imposing a discrete value of the second  
14 data pattern over one or more values of the first data pattern, wherein a different  
15 bit of the watermark is encoded in each frame of at least one subject bitframe, and  
16 wherein a same bit of the covert message is encoded in each frame of the subject  
17 bitframe.

18  
19          **23. (PREVIOUSLY PRESENTED)** An operating system embodied on  
20 a computer-readable medium having at least one program module comprising an  
21 encoding system as recited in claim 22.  
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1       24. **(CURRENTLY AMENDED)** A marked signal embodied on a  
 2 computer-readable medium, the marked signal having an encoded data channel  
 3 therein, wherein such encoded data channel has a covert data channel imposed  
 4 therein, the marked signal generated in accordance with the following acts:

5             receiving an original watermark data pattern of discrete values which are  
 6 bits of a watermark and a covert data pattern of discrete values which are bits of a  
 7 covert message;

8             imposing a discrete value of the covert data pattern over one or more  
 9 discrete values of the watermark data pattern to generate a third data pattern,  
 10 wherein the imposing is carried out by performing a Boolean operation with a  
 11 discrete value of the covert data pattern and multiple discrete values of the  
 12 watermark data pattern;

13             processing a digital signal into a series of bitframes, wherein each bitframe  
 14 includes a set of frames, and wherein each frame includes a set of blocks; and

15             encoding results of the imposing within an unmarked signal to produce the  
 16 marked signal the third data pattern into the digital signal to generate the marked  
 17 signal, wherein a different bit of the watermark is encoded in each frame of a at  
 18 least one subject bitframe, and wherein a same bit of the covert message is  
 19 encoded in each frame of the subject bitframe.

20  
 21       25. **(CANCELED)**

22  
 23       26. **(PREVIOUSLY PRESENTED)** A marked signal as recited in  
 24 claim 24, wherein the Boolean operation is XOR.



1       **27. (PREVIOUSLY PRESENTED)**      A marked signal as recited in  
2 claim 24, wherein

3                  a pattern of discrete values may be encoded into the signal in one of  
4 multiple discrete states;

5                  the imposing comprises encoding multiple values of the watermark data  
6 pattern into the digital signal into a state that indicates a single discrete value of  
7 the covert data pattern.

8  
9       **28. (PREVIOUSLY PRESENTED)**      A marked signal as recited in  
10 claim 24, wherein the marked signal is selected from a group consisting of a  
11 digital audio signal, a digital video signal, a digital image signal, and a digital  
12 multimedia signal.

13  
14       **29. (CANCELED)**

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16       **30. (CANCELED)**

17  
18       **31. (CANCELED)**

19  
20       **32. (CANCELED)**

21  
22       **33. (CANCELED)**

23  
24       **34. (CANCELED)**

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1       **35. (CURRENTLY AMENDED)**           A method for concealing data  
2       within a digital signal, the method comprising:

3       receiving a first data pattern of discrete values which are bits of a  
4       watermark and a second data pattern of discrete values which are bits of a covert  
5       message;

6       imposing a single discrete value of the second data pattern on a plurality of  
7       values of the first data pattern, wherein the imposing encodes a third data pattern  
8       into the digital signal, wherein a different bit of the watermark is encoded in each  
9       frame of at least one subject bitframe of the digital signal, and wherein a same bit  
10      of the covert message is encoded in each frame of the subject bitframe of the  
11      digital signal.

12  
13       **36. (PREVIOUSLY PRESENTED)**           A method as recited in  
14       claim 35, wherein the imposing comprises performing a Boolean operation with a  
15       discrete value of the second data pattern and a plurality of values of the first data  
16       pattern.

17  
18       **37. (PREVIOUSLY PRESENTED)**           A method as recited in  
19       claim 35, wherein the imposing comprises XORing a discrete value of the second  
20       data pattern with a plurality of values of the first data pattern.



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1           **38. (PREVIOUSLY PRESENTED)**

2       claim 35, wherein

3           a pattern of discrete values may be encoded into the digital signal in one of  
4       multiple discrete states;

5           the imposing comprises encoding a plurality of values of the first data  
6       pattern into the digital signal into a state that indicates a single discrete value of  
7       the second data pattern.

8

9           **39. (PREVIOUSLY PRESENTED)**

10       claim 35, wherein the digital signal is selected from a group consisting of a digital  
11       audio signal, a digital video signal, a digital image signal, and a digital multimedia  
12       signal.

13

14           **40. (PREVIOUSLY PRESENTED)**

15       claim 35, wherein the first data pattern is a watermark.

16

17           **41. (PREVIOUSLY PRESENTED)**

18       A computer-readable  
19       medium having computer-executable instructions that, when executed by a  
20       computer, performs the method as recited in claim 35.

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